

Synaesthesia: Opinions and Perspectives

30 Interviews with Leading Scientists, Artists and Synaesthetes

Anton V. Sidoroff-Dorso, Sean A. Day, and Jörg Jewanski (Eds.)



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Titelbild: Panel of the interactive multisensory installation "Synaesthesia:
Solomon's Case" by Christos Parapagidis, Photo: Aris Zaglis
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Dina Riccò:

Our perceptive capacities are more “nuanced”, articulated and various; perhaps the distribution of the subjects on a synesthetic scale would be more realistic.

Dina Riccò, Ph.D., is an Associate Professor in the Department of Design, Politecnico di Milano. Riccò has a Master of Science degree in Architecture (1990), and a Ph.D. in Industrial Design (1997). She was a piano teacher at several music schools in the area of Reggio Emilia, Italy (1992–93), teacher at Politecnico di Milano in the disciplines of perception and visual communication since 1996, and at the first course of “Theory and Practice of Synaesthesia” at Scuola Politecnica di Design (Milan, 2000/01). Since 2007, she has participated in organising the international conference *Synaesthesia: Science and Art*, promoted by the ArteCittà Foundation with the University of Granada and the Politecnico di Milano; she is also Director of the parallel project MuVi. Video and moving image on synesthesia and visual music. This multimedia project has been selected for publication in the prestigious *ADI Design Index 2019*, and Riccò has been nominated among the Excellences of Lombard design (Milan, December 17, 2019). Overall, she has written over 100 publications in books, specialized magazines and national and international conference proceedings. She is the promoter of and responsible for scientific content on the web sites www.sinestesia.it and <https://muvi-visualmusic.tumblr.com>.



How do you define synaesthesia?

Is it one phenomenon or several ones?

The word synaesthesia has changed its meaning over time: from its appearance in the texts of the ancient philosophers, with the expression *συναίσθησθαι* (*synaisthanesthai*) of Aristotle, in the form of a verb and not yet a noun, which follows the meaning of Castells's (1746), of *Synaesthesia* as an awareness of the disease. Then, from the definitions present in scientific production, especially in the medical field, and the dictionaries of the second half of the nineteenth century, up to today's application contexts, the meaning of the word synaesthesia has undergone dilation and delimitation over time.

This is inevitable; a word changes, is transformed, takes on multiple meanings, in parallel with the evolution of the theories that accompany the concept. If we consider the last 150 years, from the definition of Littré (1872), to that of twenty years later and more extensive than Millet (1892), until today's applications, we note that the meaning of the word synaesthesia has progressively widened, thanks also to the progressive explosion of scientific production on the subject.

The semantic expansion of the word begins with the concept of synaesthesia understood as “sensations associées” by Millet (1892) and in Italy with the concept of “bello sinestetico” [“beautiful synaesthetic”] by Pilo (1894, 1905). I think this is an important moment in the evolution of the term because it leads from synaesthesia as a phenomenon that identifies a perceptual character or specificity of the **subject**, of the individual, to synaesthesia as a character instead of the **object**, something that is no longer just *psychic* or *physiological*, but *physical*.

Considering this extended meaning of synaesthesia—combined with the study of the concept in various disciplinary fields, from neurosciences to the arts, to music, to design—I have come to distinguish three types of synaesthetic manifestations:

1. Synaesthesia as a perceptive phenomenon (the Synaesthesia proper);
2. Synaesthesia as a linguistic expression (e.g., metaphors);
3. Synaesthesia as a representation or as a “practice” (what Dufrenne calls “pratique synesthésique des arts”, 1991).

Three distinct manifestations of synaesthesia; this does not exclude that they can also be concomitant. I think the difficulty, and the differences in definition between the different theories, are not so much in defining what synaesthesia is, but who/what is synaesthetic and who/what is not synaesthetic. In particular, I find the postulates formulated by Tornitore (2000) useful; he believes that a synaesthetic phenomenon to be defined as such must include:

1. the “coexistence of two or more sensory domains (senses and/or sensations), real or virtual”;
2. “between the aforementioned heterogeneous sensory domains there must be a type of synthesis link (from analogy to identification), and not of accumulation or parallelism”.

The indications of these postulates are not trivial; in fact, we find studies in which they are mistakenly called synaesthetic phenomena, in which inducing stimulation and image induced belong to the same sensory register. This, by definition of synaesthesia, is not correct. So, I agree with an extended sense of synaesthesia; but I believe that more rigor is needed in determining what is, and what is not, synaesthetic.

To what extent is synaesthesia inborn (genetically determined)? What are the causal influences of learning and cognition in its occurrence?

I believe that synaesthetic phenomena contribute to both innate factors the cases of striking synaesthetes such as the one described by Luria demonstrate this, as well as other studies conducted on newborns; see for example the study by Meltzoff & Borton (1979)—and are acquired with learning. We find studies supporting both of these factors.

I think rather that the types of synaesthetic correspondences have a different origin. In this sense, the taxonomy that Walker-Andrews (1994) makes of intermodal relations seems to me to be explanatory; they can be: 1. amodal information; 2. artificial/arbitrary relations; 3. arbitrary/natural relations; 4. typical relations.

The *typical relations* between characters of different sensorial registers are undoubtedly influenced by experience. The *amodal information*,

which echoes the concept of *common sensorum* of Aristotle and of the unity of the senses we have seen addressed in Hornbostel (1925), Werner (1934), and Marks (1978), can presumably be understood as innate. The *artificial/arbitrary relations* are the work of man, of the designer, therefore not innate, even if the particular associative choices of the designer could respect the *amodal correspondences*. The *arbitrary/natural relations* are learned, even if in a natural context (for example, the association of a voice with a face).

In what ways is synaesthesia an advantageous, an impeding and a neutral condition?

Reading Luria's *The Mind of a Mnemonist* would lead one to think that synaesthetic perception may be considered an impediment to other cognitive and thought activities; but I think this is true only in particular subjects, and in particular levels of synaesthetic training.

For the generality of the subjects, I think that synaesthetic awareness can instead be a beneficial condition, especially for creativity. For this reason too, the relationship between synaesthesia and art has fascinated scholars, and some works by artists and musicians—we think of Kandinsky, Scriabin, and many others—are considered paradigms of synaesthetic expression. In this sense, I believe that the study of sensorial correspondences of synaesthetes can help to design communicative artifacts whose information is sensorially congruent.

Are people with synaesthesia special in any other way? Do all people have synaesthesia to some extent?

Also in this case, the reading of Alexander Luria's *The Mind of a Mnemonist* would lead one to answer that synaesthesia is a “special” ability. For some people, synaesthesia is actually “special”, as it is extremely developed, and constantly present; however, I think synaesthesia is a “normal” phenomenon. I agree when Merleau-Ponty (1945) states that “La synesthésie est la règle”, it just occurs in people at different levels of intensity and types. Marks (2009, 2011) talks about “vivid synesthesia”, a form that we find present in a few individuals; and, taking up the terminology of Osgood (1960) of “synesthetic tendencies”,

we find these in the generality of individuals. Here, I believe these are central concepts to help the community of scholars to order and define a shared theory of synaesthesia. In essence, to my thinking, synaesthesia is a *multiform phenomenon*, and is also present at *different levels* of intensity (vividness) in the generality of individuals.

What is your story (and impression) of reading Alexander Luria's *The Mind of a Mnemonist*?

My impression is partly expressed in the two previous answers. In general, the book, and Luria's research, are the amazing proof that the mind has no limits. Reading the book also leads to more general reflections, not strictly related to synaesthesia: namely, the relationship between the imaginary world and the existing world, between physical reality and imagined reality. It reminds me of a particular dialogue of the science fiction film *The Matrix* (1999), in which Morpheus, one of the protagonists, says "What does it mean, real? Give me a definition of real. If you refer to what we perceive, to what we can smell, touch and see, that real are simple electrical signals interpreted by the brain."

For man, the real world is the phenomenal world, the world that is aware of perceiving through the senses. In fact, to Mr. S., the difficulties emerge when the imaginary world, the mental images that are so "blinding" in him, come into conflict with reality, blocking the possibilities for action.

Why is it important to do research into synaesthesia? What are its promises for cognitive science or science at large?

I particularly study the relationship between synaesthesia and design, specifically the functions of the synaesthetic project, intended as a project that pays attention to the relationship and the coherence between sensory information, in which the current meaning of synaesthesia as "simultaneous perception" is united with the Aristotelian one of effective perception and awareness of perceiving. In this conception, I think that research on synaesthesia, and the synaesthetic project, can be useful, in particular for the following: 1. to design effective communicative

artifacts, in which the information between the different sensory registers is coherent with each other; 2. to design communicative artifacts accessible to all, including users with sensory disabilities.

A vicarious sense can take the place of a missing sense, or that particular non-functioning condition, if activated for synaesthesia. We know that this is physiologically possible. Studies conducted in neuroscience, using brain visualization techniques — see the works of N. Sada-to (et al., 1996), Krish Sathian (1999), and Oliver Sacks (2003) — show how much the brain is plastic, and how, for example, a tactile stimulus can activate the visual cortex, to produce visual mental images even without corresponding stimuli. This happens in blind people, who remodel the lost capacity in other senses; but the same happens for those who are temporarily “blind”, i.e., when they are blindfolded, while performing a tactile task. Therefore, the ability to define synaesthetic correspondences with intersubjective validity would facilitate the project of effective communicative artifacts.

A second area in which the study of synaesthesia is important, for those involved in design and training of designers, is a function of creativity, in teaching activities and training a creative attitude that has the awareness of synaesthetic perception. Also, in this case, what for us it would be important to define, and therefore to have an answer, is essentially what synaesthetic correspondences, which characters, in which sensory registers, do we recognize as an intersubjective validity.

Regarding pedagogical methods, how do you help students distinguish and discriminate between cross-modal correspondences and synaesthesia? What do you explain about synaesthetes’ potentials? Who of the world-famous artists and composers do you consider true synaesthetes?

I state I consider it improper to divide the subjects clearly between *synesthetes* and *non-synaesthetes*. Our perceptive capacities are more “nuanced”, articulated and various. Perhaps the distribution of the subjects on a ‘synesthetic scale’ would be more realistic, at whose extremes there are rare conditions: on the one hand the total absence of synesthesia (I assume rare) and on the opposite side the high

synesthesia (equally rare; see for example the case of Mr. S. described by Luria). While at the center there are hybrid conditions of various synesthesia intensity.

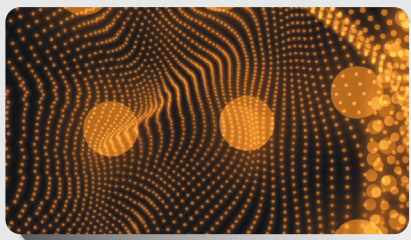
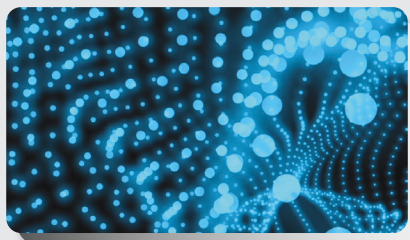
Students usually do not distinguish the differences between the concepts of *synaesthesia* and other related terms, such as *cross-modality*, and even the more general *multisensory*. To explain the concept of synaesthesia to students, first of all I describe the historical case studies, taken from Lussana (1873) and Lemaître (1901), observed on students. I also describe the particular case observed by Luria, and recently the classification of the types of synaesthesia present in the book by Sean A. Day, *Synesthetes* (2016). In a second phase, I propose practical exercises.

In general, I propose two types of exercises to help students gain greater awareness of the cross-modal relationships and the intersubjectivity characters of certain sensory correspondences.

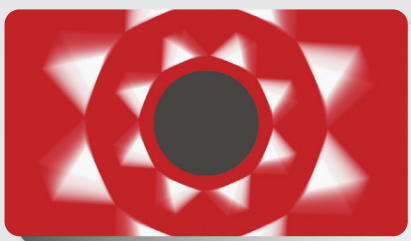
1. A first group of tests—which I call of *synesthetic interobservation*—consists in listening to some (2–3) pieces of music extracted from audio / video footage, and in the recognition of the visual correspondence between some (2–3) animation videos (without audio) presented. A brief description of this exercise on Fischinger's films can be found in my book *Sentire il design* (2008).

2. A second group of exercises, on the other hand, requires a greater effort; that is, not only choosing or coupling a visual, but also conceiving, representing, visualizing, a sound / musical content. This generally meets greater difficulty for students: it is simple to synchronize a visual with a sound; it is much more difficult to find the right shape and even more (for the subjectivity of correspondences) the right color. This is what we did for example at the last conference of the Artecittà Foundation in Alcalá la Real, Spain, 2018, with a video project presented for the *Boléro event* conceived by Ninghui Xiong.

These experiences lead students to have a greater awareness of the interactions between sensory registers, and the difficulties of visual mental representation of a musical content, but also of the intersubjectivity of some audio / video correspondences. The figure of the artist who best represents for me the synaesthete subject is the Swiss



Two frames from the video *Baba-Yaga*, synaesthetic translation of composition *Pictures at an exhibition* by Modest P. Mussorgsky —produced by the students of the “Appliances and complex systems design studio” (Politecnico di Milano, Design School, A.Y. 2010/2011). Directors, professors Dina Riccò and Antonio Belluscio, with the collaboration of teaching assistants Gian Luca Balzerano, Alessandro Zamperini. Provided by Dina Riccò



Four frames from the video *Boléro 2018*, synaesthetic translation of composition *Boléro* by Maurice Ravel, produced for the exhibition *Boléro* (ed. by Ninghui Xiong et al.) —part of the *VI International Congress Synaesthesia, Science & Art*—by the students of the “Appliances and complex systems design studio” (Politecnico di Milano, Design School, A.Y. 2017/2018). Directors, professors Dina Riccò and Gian Luca Balzerano, with the collaboration of teaching assistants Alberto Barone, Giulia Martimucci, Alessandro Zamperini. Provided by Dina Riccò

painter—as well as graphic designer, animator and amateur musician—Charles Blanc-Gatti (1890–1966). The graphic and chromatic characters of his works, which among other things frequently have musical titles, his “vision” of the music, correspond well to the descriptions of the percepts we find in the case studies on synaesthetes. Another author that I always present to my students is Oskar Fischinger (1900–1967), regarding whom, although he does not have a certain testimony of “true” synaesthetic perception, the visual kinetic translations of musical pieces, the audio / video synchronization, the high abstraction of the compositions, well represent the visual characters of the synaesthetic percepts.

In terms of integrating synaesthetic aspects to modern architecture, looking at the latest computer and digital technology, what do you feel is the biggest mistake people (e.g., students) are making?

What I observe in my Design students at the Politecnico di Milano is the difficulty to break away from the configurational limits of digital techniques. That is, the difficulty in thinking about something that cannot be done, or I cannot do (draw), with the computer. *Technical ability* strongly affects *creative ability*. I am not referring to the result; in all ages, the quality of the final artifact is conditioned by the technical ability. I refer instead to the predisposition to experiment with new techniques: they seem, for the students, to be all filtered by the screen and its limits, forgetting other analogical and material possibilities.

Today’s digital technology allows an anticipation, and a forecast, of the constructive and design results, much more advanced than in the past, but we find it more difficult to go beyond the known technical limits. Digital technology expands the possibilities, but at the same time “limits” extradigital experimentation, and in some aspects also creativity.

Regarding your understanding of the influence of culture on the sensorium and culture-related specifications of the synaesthetic models, do you think that synaesthetes are people with novel, advanced capabilities or those who retained this phenomenon throughout the course of evolutionary changes?

I think that the environment, the culture and the technologies influence our sensorial response and consequently that the quality (or the subjects / objects) of the perceptions of the synaesthetes change accordingly. However, the detectability of new skills is conditioned by the way we study these skills, recognize them and catalogue them. That is: if the definition of synaesthesia that we apply today is the same as applied a century ago, it becomes more difficult to recognize diversity, what has changed, and what are the new capabilities.

If sensoria (models of cross-modal correspondences) change throughout history and seem geographically and culturally modifiable, too, do different sensoria generate irreconcilably different ways of meaning-making? What is special about modern western culture in terms of the interrelation of the senses and related meaning-making? (How) can we answer the question of what it is like to be a synaesthete?

The peculiarity of modern culture I think is to be found in *invasiveness*, *immersiveness*, real / virtual *hybridization* of digital technology that, on one hand, differs from materiality, from physicality, with its own sensorial qualities, and, on the other, *simulates sensations*.

The result is that, in the quantity and variety of sensations—both real and simulated—everything becomes more difficult to distinguish, not only between real and simulated, but also in the specifics of the qualities of sensations. For example, what is *visual* and what is *tactile* in an image that I touch on the screen? I could equally say this for printing techniques that simulate, sometimes reproduce, tactile qualities: the cover of a book is “to be seen” in the bookshop, but new printing techniques increasingly invite “to touch”.

It is much more difficult (compared to the pre-digital age) to distinguish the limits between the sensory registers and always stronger that *The Unity of the Senses* so lucidly intuited by Marks (1978). We therefore return to the central question: what does it mean to be a synaesthete? I think we should once again confront each other and propose an updated definition that considers the mutation of the perceptual experience produced by digital technologies.

Being a non-synaesthete yourself, would you want to have synaesthesia? If so, which type of synesthesia would you most like to have, towards doing research on yourself?

In effect, if we have as reference to “true” synaesthesia, cases like S. described by Luria, I am not a “true” synaesthetes, I have nothing of constancy, of vivacity, of the memorability of such perceptions. However, I consider myself synesthetic in the meaning of Merleau-Ponty when he says “La synesthésie est la règle”, or some correspondences (e.g. colors / smells) disturb me and in general I can not help but connect, and merge, perceptions from one sense to another. Anyway, yes, I would like to experience the emotion of what we call “true” synaesthesia.



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Synaesthesia: Opinions and Perspectives

Anton V. Sidoroff-Dorso, Sean A. Day, and Jörg Jewanski (Eds.)

Synaesthesia is a remarkable phenomenon: It unites scientists and artists, as well as different disciplines such as neuroscience, psychology, music, art, philosophy and linguistics. This book is a collection of interviews with scientists and artists who explore synaesthesia. We asked similar questions to each of them: e.g., How can synaesthesia be defined? Is it inborn? Are synaesthetes special? How does it influence visual artists? Thirty people talked with us, including many of the world's leading synaesthesia researchers, such as Richard E. Cytowic, Lawrence E. Marks, Jamie Ward and Edward M. Hubbard, and famous synaesthete artists such as Anne Patterson, Carol Steen, Timothy B. Layden and Raewyn Turner. Our interview partners from North and South America, Europe, Australia and New Zealand helped create this unique collection and provided many insightful ideas, colourful illustrations and unforgettable descriptions of their experiences.

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